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ON SOME CONCEPTUAL ERRORS RELATING TO FORCE AND MATTER.

PROFESSOR W. STANLEY JEVONS, an orthodox authority in science, of high standing, merely repeats the statement of all capable scientific writers in saying, "Science does nothing to reduce the number of strange things that we may believe. When fairly pursued it makes absurd drafts upon our powers of comprehension and belief."

This is true in every field of the natural sciences; no superstitions of what are called the pre-scientific or dark ages ever exceeded in absurdity many of the statements which science, fairly pursued, and ready to present its problems openly and boldly, makes and asks us to accept as the necessary corollaries of what are deemed infallible scientific facts and principles. The same writer says, "Is it not rather true that we have but to open a scientific book and read a page or two, and we shall come to some recorded phenomenon of which no explanation can yet be given? In every such fact there is a possible opening for new discoveries."

But they who speak in the name of Science are not always honest in presenting these unexplained facts; they are apt, sometimes, to jump the question, and ignore differences which no scientific knowledge can reconcile with natural principles or established facts, as we know them. The same writer says,— "I am inclined to find fault with mathematical writers because they so often exult in what they can accomplish, and omit to point out that what they do is but an infinitely small part of what might be done. They exhibit a general inclination, with few exceptions, not to do so much as mention the existence of problems of an impracticable character."

Science, as taught, in other words, is often likely to present its

case as would a skilled lawyer addressing a jury, for the one side or for the other, and not as an impartial judge, fairly weighing the evidence presented by both sides; perhaps indeed the evidence for the opposite side has been refused any consideration, or even a hearing. And yet the vast importance of these unexplained facts, to realise what, and how imperfect even, science really is, and to open the way for such new discoveries as have often unwillingly enough shifted the whole kaleidoscope of sciences, Sir John Herschel has emphasised in his great work on Astronomy by saying, "Almost all the great discoveries in astronomy have resulted from the consideration of Residual Phenomena, that is to say, such as remain outstanding and unaccounted for after subducting and allowing for all that would result from the strict application of known principles."

Dogmatism is no part of genuine science, and a moment's consideration will demonstrate the fact; for if science to-day may dogmatise, then it might have dogmatised in the past, and so back to the days when there was little or none of what is now called science; and hence science could never have had so much as a true beginning, and all we now know of science, would be classed, by so-called men of science, merely as gross and ignorant superstition. For there is no fixed centre in science; all is changing with the changing observations of new facts, and its dogmatism is mere bigotry, comparable with which religious bigotry becomes respectable, for it at least claims some fixed centre around which to revolve, while science can only claim to imperfectly record a few observed phenomena, and deduce a few inferences, which never can be stronger than the value and relative scope of the observation, nor more certain than the proportion existing between the few observed facts, in any case, and the vast aggregate of unobserved and possibly discordant facts in the same case.

The Holy of Holies in Science is merely a dark chamber set up by a few teachers who require, for their own purposes, a straight road for teaching, in which extraneous matters are merely stumbling blocks and interferences, of which the least said the better; of which, in fact, nothing at all is said, they are simply ignored.

Says Jevons, speaking of such writers as Comte and John Stuart

Mill, with whom are to be classed Huxley, Tyndall, and Herbert Spencer,—“At least these and many other writers fail to impress upon their readers a truth which cannot be too constantly borne in mind, namely, that the utmost successes which our scientific method can accomplish will not enable us to comprehend more than an infinitesimal fraction of what there is to comprehend.”

Recollect that he says “our scientific method,” for he does not deny that we can comprehend to an indefinite, almost to an infinite extent, possibly, and can constantly learn to comprehend more and more, and to reach certainty, if need be; but that we cannot do this to any considerable extent at all by “our scientific method,” which excludes, of necessity, those Residual Phenomena, lying outside, of which Sir John Herschel speaks, and which are merely disturbing factors lying beyond the bounds of known science at the time, and yet by means of which nearly all, perhaps all, the great scientific discoveries and advances have been made. Says Jevons, of these cases,—“The supply of new and unexplained facts is divergent in extent, so that the more we have explained, the more there is to explain. The further we advance in any generalisation, the more numerous and intricate are the exceptional cases still demanding further treatment. Can any scientific man venture to state that there is less opening now for new discoveries than there was three centuries ago?”

It is well to guard ourselves against the contemplation of so-called Science as a rotund and complete thing, a perfect whole, to be bowed down before and worshipped; it is, on the contrary, a vast battle-ground on which the combatants, in the pursuit of truth, are not arrayed in opposing armies, but are fighting each other man to man, individually, all over the field, and from every point of vantage, and with the ally of this instant the antagonist of the next. And this is the only proper conception of Science as a living thing, and out of it, thus contemplated, vast good must come, and has already come; all the good of science, in fact, has come; and its scope will include, nay, it even now includes, those researches and determinations which find brute or crude materialism to have failed utterly when pushed even measurably toward the ultimate, and those other researches and

determinations which bring the psychism of a universe, or of deity, into the problem as a demonstrable factor.

All science asks, or can ask, is that scientific means shall be employed in examining and deducing, and that the field be broad and not narrow, and that the facts be many and not few, that they be well authenticated, and proven and re proven, and that the investigators be true and capable, and not false and incapable.

And it is no derogation from the scientific value of these investigations and determinations that they may, perchance, find their controlling principles, in whole or part, previously deduced or discovered by methods coming down to us from an age which we denominate the pre-scientific, or unscientific; because, until we have pushed our investigations to a logical and tactical conclusion, far, far beyond present possibilities, we do not know whether we may not ourselves land in a region in which means of acquiring knowledge may be discovered higher, or broader, and more secure even, than those we work with in our own limited field of to-day, and it is merely begging the question to discredit such scientific results because they may chance to resemble "pre-scientific" knowledge. As well might the ledge-miner for gold, who excavates and blasts and crushes and decomposes his metal-bearing rock, discredit the value of the great open placers where barbaric and untaught men of old gathered the finest gold from the open sands of the desert, or the beds of pre-historic streams, to deck their persons with magnificent breastplates and necklaces, or braid their banners, and line the walls of their homes and palaces. The mint, the test of all, makes no discrimination, for the law of the miner is the law of Science — "the gold is where you find it."

With these prefatory remarks, I wish to speak of some erroneous popular views of what have been called Force and Matter, which views are not held really by men of science themselves, but which, as an easy way of settling the question, have become widely disseminated and firmly fixed, like the fixed ideas of paranoiacs, in the popular mind. It has been called, sometimes, the science and philosophy of tailors and shoemakers; but it is in fact the science of those who like to provide themselves with simple and compre-

hensive explanations of what has not been personally investigated or pursued by them themselves, but accepted like a faith, as a convenient rule of belief: It is, in fact, on the same plane as some of the dogmas of certain sects of religions, whether Christian, Buddhist, or Pagan, and it may be described as the tenaciously held dogma or superstition of the priesthood of irreligion.

It is absurd, of course, to conceive of a thing which is inconceivable, and still worse to believe and swear by a thing which is inconceivable. New force which is not acting on something is totally inconceivable; it is movement without motion, strain without anything to strain against, or impulse without anything to act against; it is, in fact, not only inconceivable, but is a contradiction in terms. It is only when something is moved that we have motion, or when some impulse is operative on something that we can have any conception of it. If there were no matter, in a merely physical universe, there could be no force in that universe; that is to say, no self-caused cosmical force. With the force of will I will deal hereafter; but in this case there can be no will without an existent and intelligent willer.

As of force, the same is true of matter. If matter were deprived of all its properties, solidity, color, taste, smell, hardness, coldness, heat, electricity, and the like, it would cease to be matter, for it would not have the properties of matter; matter is only known, and can only be conceived of, as having properties. Yet these properties are all manifestations of force or forces, acting to produce the perception or conception of matter. Hence *force* and *matter*, as separate entities or existences, are simply inconceivable mental vagaries, having no actuality—are in fact mere transcendental abstractions, purely metaphysical, and by holding to which, those who adhere to them in the guise of materialists, merely show that they may be capital metaphysicians, dealing with the baseless and hypothetical, but can have no standing as men of science, and above all no standing as materialists, which is what they claim, nevertheless, to be.

All we know is *energy*, that is, matter undergoing change of form or place. This is conceivable and actual.

The alternative result, in dealing with force and matter, was clearly shown by the sequence of the philosophies of Locke, Berkeley and Hume, in which Locke set up his theory on the working out of matter in the development of mental phenomena (although he himself did not really claim to do this, but left an accepted *terra incognita* of divine mentality behind); then Berkeley, taking advantage of a statement of Locke, that at different periods of our lives the same object appears to us quite different, built up his theory that matter as matter was non-existent, and that we only conceived of it by a sort of mental jugglery. Then came Hume, who took hold of Berkeley's thesis, and showed that, since mental changes were as various and obvious as material or physical changes, and hence as unreliable, all existence could be reduced to nihilism, leaving only a universe filled with floating and haphazard ideas or streams of uncaused and useless consciousness, dreams within dreams, and without the individuality of even a dreamer.

So far as we know, whatever is the basis of matter is the basis of force, whatever is the manifestation of matter is the manifestation of force; and they are only known when co-acting as energy. We have a material universe, and we have, in this universe, mentality: whether it be confined to the human race, animals, and perhaps vegetables, or whether it extend elsewhere, we know that there is mind, for without mind there would be nothing cognisable, nothing conceivable, nothing to cognise or conceive, nothing existent, unless as a wild and senseless chaos, if at all.

What Lamarck called the "Order of Nature" is what we contemplate around us and in us. It existed before we were born, and we know that it will continue to exist after we are dead.

Science deals with this order of nature, and with it alone.

Has it always existed, or has it had a beginning? This, of course, is the great question.

Materialists, who deny any mind in the universe, except that which is or may be a by-product of the order of nature, are logically compelled to assume that this order of nature has been eternal in the past. It is not because this particular order now exists that it must be assumed by materialists to have always existed, for it may

be the outcome, they might say, of another order, and so of another, and so on eternally.

But this position is untenable for three reasons. First,—since materialism claims its basis in natural science, it can find no stability unless natural science is stable, and natural science owes all its stability to the stability of the present order of nature. To assume another order at another time, when we have nothing but a bare assumption behind it, is like the feat once attributed to the rope-walker Blondin, who proposed to wheel a wheel-barrow along a rope stretched across the whirlpool of Niagara, and coil up the rope in the wheel-barrow as he passed across the chasm. Or like the feat of Jack and the Bean-stalk, who found himself on the moon, and let himself down to the earth by weaving a rope of chaff forty-five miles long, attaching it to one of the horns of the moon, and climbing down to the end of it, unfastening the upper end, and tying that to the lower, and so on alternately till he reached *terra firma*.

Another reason for denying, as a scientific assumption, any other order of nature, lies in the fact that it does not simplify the problem, but merely sets the solution back one step, for, as has been well said, "an infinite series of causes is not a cause."

Of course materialists may fall back on the fact that in such a series there may be found somewhere an initiative cause, but this also begs the question, for, if so, there may just as likely have been an initiative cause in the present order of nature, which concession, of course, abandons the whole argument.

I shall show, later on, that such successive orders of mere physical nature are not possible, if the present order of nature is itself possible; and that it is possible we all know, because it exists, for we see it all around us.

As a part of the present order of nature we have the attraction of gravitation. As stated by Newton, and accepted by all natural science, every particle of matter in the universe attracts every other particle of matter in the universe, and is attracted thereby, with a force varying directly as the masses and inversely as the squares of the distances between them, and they tend, in consequence, if not held apart by a stronger energy, to approach each other in accord-

ance with the terms of this law, gradually but rapidly accelerating their rate of approach as they advance toward each other, inversely as the squares of the distances diminish. This law of gravitation, and the presence of gravitation, appear to be co-extensive throughout the universe, as they ought to be, and must be. The most distant binary stars, far, far beyond the reach of the most delicate parallax to determine their distances, are found to rigidly obey this law, as their components rotate around each other.

Hence all the particles and masses of matter, all the suns and planets, comets, meteoric bodies, nebulae, and "all the host of heaven," are and must be constantly drawing nearer and nearer to each other, as dissipation of energy continues its wasteful course among the working factors of the universe, for dissipation of energy is the only possible means for the transformation of energy.

Astronomers picture what will be the fate of our own system when all the planets have been drawn by retardations into the sun, (for every little shooting-star or meteor which enters our atmosphere or falls to the earth retards the earth's motion, and space is filled with such material, massive or diffuse), and when the sun itself has cooled down, by the dissipation of its energy, to a black, dead and relatively inert mass. And so of all the universe; the same attraction will be drawing together other solar systems, and other galaxies, and our own with them, and all will end in one mass of eternal stillness, darkness and death. During these processes there will be collisions in space, and these cataclysms will spasmodically and temporarily expend themselves in space, for dissipation of energy will continue, and in a little while quiescence will be resumed, and the great orbs will be ready for new collisions, till all have collided, and the process has become complete.

No student of natural science will deny this inevitable ending, for all nature is dissipating energy throughout space, and the tendency is down-grade as a whole, from a starting-point of high and unbalanced potential to a culmination, by equilibrium of energies, in silence and darkness. I do not believe that such events will necessarily occur, because I do not believe in a merely physical universe of this sort, but in one prepared and carried on by creative power; but, as-

suming a merely physical universe, science is right, and such an ending is inevitable.

Now, if the present order of nature has been eternal in the past, and dissipation of energy and the attraction of gravitation have been, as they must have been, efficient throughout the eternal past, it is obvious that all these possible changes must have taken place already in the unnumbered æons of the past, and that the present order of nature could not now be in operation at all. But it is in operation, for we see it; hence, the present order of nature has not been eternal in the past, but must have had a beginning in finite time; and no sequence of successive orders of nature could possibly have prevented this, but at most could have only retarded the result, which must still have been completed long before

“The foundations thereof were fastened,
Or the corner-stone laid thereof,
When the morning stars sang together,
And all the sons of God shouted for joy.”

Unless, as I have said, there was somewhere a power of initiative (and, as I shall show, any reversal of the order of nature demands an initiative), this result could not have been avoided; and if initiative ever existed, it might just as well have originated the present order of nature, as to have originated or reversed another order of nature for which, in the absence of initiative, there is not the slightest warrant or possibility in science, observation, or good sense.

What has been said above of gravitation is not confined to gravitation. Every process of nature demands and employs the same principle of degradation; the whole universe is running down-grade from an accumulated high potential at the time it began its down-grade course. During this down-grade progress, work has been done; enormous work is still being done. Measured in foot-tons, the expenditure of energy is incalculable.

Now to raise the universe to the potential of its starting-point would, to-day, require the expenditure of as many foot-tons of outside energy as have been expended throughout the universe to reach

its present low level. What possible source of such energy can be conceived of?

I will, at this time, therefore, indicate the third reason why a new order of nature, to reverse the present order of nature, is not only inconceivable, but impossible, if the present order of nature itself exists.

Take a cannon-ball and elevate it a hundred feet above the earth's surface, and let it drop. On its contact with the earth it will manifest a definite amount of distributed energy, a part as heat, a part as displacement, and a part as light, electricity, etc., and it will then rest on the earth's surface with the same weight as it had before it was raised. Now everybody knows that it required just as much of an expenditure of energy to raise that cannon-ball to the height of a hundred feet as it manifested in its fall. That is a self-evident proposition, and, if applied to the universe, will clearly demonstrate that no new order of nature, an "order of elevation" instead of one of degradation, could possibly exist, whether as a sequence, an alternation, or an antecedent. It is a contradiction in terms, for the following reasons:

The universe, in running down, becomes quiescent by dissipating or satisfying its opposing energies, so as to reach a position of stable equilibrium from one of unstable equilibrium, which is that from which the present order of nature started. We find the energies of repulsion existing everywhere, just like the energies of attraction, but with this difference. All the energies of repulsion are themselves necessarily secondary, and are the results of the same processes of degradation which are operative throughout nature, and which, in fact, constitute the manifest order of nature. Electrical repulsion is merely the manifestation of unsatisfied electrical polarities which have been sheared off the balanced electricities of the universal ether. A dynamo will so shear these electricities apart, but it requires as many foot-pounds of energy, not considering the waste or dissipation, to place these opposing electricities in such separation as either to attract or repel each other, as the same electricities will develop in again flowing back and uniting in a state of equilibrium. Gases repel each other, but this is simply because their molecular

heat has not yet been dissipated into space. When gases reach a temperature not so low even as the temperature of interstellar space, they will have first become liquid, then solid bodies, and repulsion will have ceased, just as in a mass of rock. Repulsion is kinetic, and, so to speak, artificial, while gravitation depends on aggregation, and when the whole material substance of the universe shall have become compacted into one vast whole, then its attractive force will have increased by contiguity to an almost inconceivable extent, in first forming and then maintaining the mass.

An analogy for a new order of nature has been imagined in a counting-machine, constructed to count up, one by one, to a vast total, and then, as the machine continues to run, by a pre-calculated change of a tooth in a gear, to count backwards, one at a time, and so reverse the process. But the process is not reversed; the counting is not the significant factor at all, but the running of the machine is, and that will require not only the same amount of energy, but the same energy, to count backwards as to count forwards. And the count, too, will be all the same, one more is added at every beat of the lever, whatever you may call the result. A dog does not acquire five legs by calling his tail a leg. Now let us suppose that the present order of nature has run its downward course to its culmination, and that a new order of nature is to begin, reversing the old order, and in which every process is reversed, and potential is piled up instead of dissipated or satisfied, as at present.

First the attraction of gravitation, or at all events the cohesion or gravitation of the mass, must be dispensed with, or neutralised. To neutralise this, which will certainly not neutralise itself if it is a dynamic phenomenon, will require, *ab initio*, as much expenditure of energy as would be required to accomplish the same work by an ideally perfect set of rock-breakers and crushers, run by steam-power.

If attraction must be neutralised it must be mechanically overcome, and where, in the present order of nature, is this new mechanical energy to be derived, because we have assumed that our entire present universe has run down to its culmination, in the dissipation and balancing of potential and kinetic energy throughout?

Surely this energy cannot be derived from the energy of one part of the universe lending itself to another, because this would only prolong the apparent time, but would not alter the process or result. Nor can we overcome the difficulty by assuming that the new order of nature may begin before the old one has completely run out, for this partial reversal is quite as difficult as an entire reversal; nay, more so, as the kinetic agencies would have to be violently taken hold of and mechanically turned about and made to work backward and upside down, henceforth, against their own energy. So this new energy to reverse the old energy cannot come from the material universe as a whole, nor from any part of the material universe. Hence it must come, if at all, from outside the material universe, and what is outside? If the present order of nature is co-extensive with the universe, then there is nothing outside; if it is not co-extensive with the universe, then the same process of degradation must go on, however often supplemented from outside sources, only the rate being changed, the process and result remaining the same; and in a past eternity, or a future eternity, the rate does not affect the problem in the slightest degree, and the end would long ago have been reached just the same.

Of course an infinite creator could halt all processes of nature, or reverse, or start them up again at will, for an infinite creator, by the very nature of the conception, possesses an infinite initiative. But a merely physical, self-contained, self-propelled and self-destroying or dissipating order of nature certainly has no power of arrest, and no power of reversal, as Lamarck, whom I shall quote later on, clearly shows, and we can never have a new order of nature substituted therefor without mechanically accounting for all the residue of the present order, and building up against it an artificial power sufficient to coerce and reverse it, for which there is no material anywhere, and for which there never can be any, whatever superstition may project or fancy predicate.

But if there is no power to institute a reversed order of nature, much less could there be any power in the machine to subsequently erect itself into higher and higher potentials, in the absence of a constant external reserve, which has been excluded, or of a creative

agency with unlimited power of initiative, which is the point at issue, and which materialism denies.

It is an axiom of philosophy, as well as of ethics and physical science, that "you cannot grind with the water that is past."

A universe in which attractions are changed to repulsions would never build up a potential, for it is of the very essence of repulsions that they dissipate themselves; they operate radially outward to split themselves up into space, and, unless arrested in spots by an extraneous obstacle, this radiant escape must continue forever, along right lines; whereas, in building up a potential, it is absolutely necessary, whatever sort of universe be predicated, that there shall be condensations, gatherings together, concentrations of energy above the environment, to which dissipation is fatal, and with which it is eternally irreconcilable.

In such a new order of nature there could be no light, heat or electricity, and nothing which could serve as substitutes for them, because there could be no vibration or oscillation; for vibrations themselves by their very terms are compelled to dissipate themselves away from all their sources, more and more widely apart through space.

Nor could gravitation in the mass, when overcome by a stronger energy (which is impossible, as I have shown, since there is and can be no possible physical source of such energy), so as to cause water to habitually run up-hill, and stones, first, and afterwards molehills, and then mountains and continents, to fly forth and scatter into outer space, accomplish any such results by its reversal. The power required to accomplish this, as I have shown, is precisely the mechanical power required to accomplish it to-day, and it does not exist. And, if atoms and molecules did take flight by some power of repulsion, it could only be by such inter-atomic activities as now keep the particles of gases apart; and potential for these new movements would have to be accounted for, and the heat provided to accomplish these results. But having nothing analogous to heat in the new order of nature, and nothing capable of acting as its substitute, such events as the dissipation of atoms universally through space could not occur in any conceivable alteration of the present or-

der of nature. Nor, if they could occur, would it be possible to have potential piled up thereby, but more and more dissipated, which is the prolific source of the present progressive ruin.

It is for these reasons that I have said that nothing of the kind could occur either as a sequence, an antecedent, or an alternative, provided the present order of nature has any existence at all. Of course, if this is all a sham, then we can have any number of similar shams, either forward or backward, right-side up, or upside down, and without waiting for the end of anything, merely using those senseless and discoördinated streams or streaks or clouds of consciousness without connection or sequence, those dreams within dreams, and without a dreamer, to which Hume, in his splendid *reductio ad absurdum* of Locke and Berkeley, reduced all the phenomena of the physical in the flash-light of one universal and eternal nihilism.

There can be no rational doubt, therefore, that the present order of nature has had a beginning, and that, at the period of this beginning there was stored up, by some adequate agency, a potential energy, ready to be unloosed, that is to say, in unstable equilibrium, sufficient in amount and persistence to carry along all the transformations which we know to have passed, and all those now passing, or which will pass.

Or else, when this beginning appeared, there was some adequate agency which could build up all the potential required for the beginning, and supply all that required for its running, as events transpired, and transformations progressed.

In either of these cases something at that beginning must have had the power of initiative, the power of creation. Herbert Spencer supposed that the law of persistence of force might account for all down-grade transformations which have occurred in the order of nature, not seeking, however, to account at all for the primordial store of unstable energy, which omission destroyed his argument at the start. But as that brilliant pupil of, and co-worker with, Charles Darwin, the lamented George J. Romanes, says, in almost his last work,—“It may be true that causation depends upon the ‘persistence of force’; it does not follow that all manifestations of force should

on this account have been directed to occur as they do occur. For, if we follow back any sequence of physical causation, we soon find that it spreads out on all sides into a net-work of physical relations which are literally infinite both in space (conditions) and in time (antecedent causes) * * * Physical causation cannot be made to supply its own explanation, and the mere persistence of force, even if it were conceded to account for particular cases of physical sequence, can give no account of the ubiquitous and eternal direction of force in the construction and maintenance of universal order." Long before Romanes, Sir John Herschel, in his magnificent paper "On the Origin of Force," concludes as follows: "Will without Motive, Power without Design, Thought opposed to Reason, would be admirable in explaining a chaos, but would render little aid to account for anything else."

But it has been asked, if the present order of nature arose in finite time from the intelligent activity of an infinite creator, what was the condition of things before that period? Was there matter or force in the form of energy there? If not, how did this creator make something out of nothing, create the universe from nothing, create the energy to carry it on from nothing, create the sequences and transformations, and all the past, present, and future, out of nothing? What was he doing before that date? Well, nothing so violent need be asked or predicated; we simply do not know what other universes may have preceded, or what will follow this one. We know that if there were initiative intelligence and power enough to start and maintain the present order of nature, that intelligence and power were greater than the present order of nature, while we are but a very subordinate portion of merely the present order. We need not know, for we are no part of it, and there is no call to speculate, if we have once found a rational and scientific origin for the present order, one sufficient in scope, adequate in power, and comprehensive in plan; for if that intelligent creator ever lived he still lives; if he ever was sufficient, he still is sufficient; if the harmonious order of nature is of his devising and executing, he is a lover of order and harmony; and if creation has culminated in living forms, and these have advanced from lower to higher, from narrower to broader, from

less intelligent to more intelligent, from more gross to more spiritual, from worse to better, from enmity to fellowship, from cruelty to kindness, from servitude to freedom, from ignorance to knowledge, and from the carnal and earthly to the psychical and the spiritual, then we know that we are aspiring and ascending, somewhat at least, towards him, so that we can understand him and grow more and more like him, in a weak and feeble way it is true, but as rapidly and as perfectly, we may be sure, as our present physical limitations will permit.

What is this great governing psychism of the universe? Lamarck defined it, a hundred years ago, as "An order of things composed of objects independent of matter, which are determined by the observation of bodies, and the whole amount of which constitutes a power, unalterable in its essence, governed in all its acts, and constantly acting upon all parts of the physical universe. . . . The power which has created Nature has, without doubt, no limits, cannot be restricted in its will or made subject to others, and is independent of all law. It alone can change Nature and her laws, and even annihilate them. . . . If Nature were an intelligence, it could exercise volition, and change its laws, or rather there could be no law. Finally, if Nature were God, its will would be independent, its acts unconstrained; but this is not the case; it is, on the contrary, continually subject to constant laws, over which it has no power; it hence follows, that although its means are infinitely diversified and inexhaustible, it acts always in the same manner in the same circumstances, without the power of acting otherwise."

Says Sir John Herschel, "Whenever, in the natural world, what we call a phenomenon or an event takes place, we either find it resolvable ultimately into some change of place or of movement in material substance, or we endeavor to trace it up to some such change; and only when successful in such endeavor do we consider that we have arrived at its theory. In every such change we recognise the action of FORCE. And in the only case in which we are admitted into any personal knowledge of the origin of force, we find it connected with volition, and by inevitable consequence, with *motive*, with *intellect*, and with all those attributes of mind in which—and not in the possession of arms, legs, brains, and viscera—personality

consists. Constituted as the human mind is, if nature be *not* interpretable through these conceptions, it is not interpretable at all."

Says Romanes, "Throughout this universe of infinite objectivity—so far, at least, as human observation can extend—there is unquestionable evidence of some one integrating principle, whereby all its many and complex parts are correlated with one another in such wise that the result is universal order. And if we take any part of the whole system—such as that of organic nature on this planet—to examine in more detail, we find that it appears to be instinct with contrivance. So to speak, wherever we tap organic nature, it seems to flow with purpose; and as we shall presently see, upon the monistic theory the evidence of purpose is here in no way attenuated by a full acceptance of any of the mechanical explanations furnished by science. Now these large and important facts of observation unquestionably point, as just observed, to some one great integrating principle as pervading the Cosmos; and, if so, we can scarcely be wrong in supposing that among all our conceptions it must hold nearest kinship to that which is our highest conception of an integrating cause—viz., the conception of psychism. Assuredly no human mind could either have devised or maintained the working of even a fragment of Nature; and therefore it seems but reasonable to conclude that the integrating principle of the whole—the spirit, as it were, of the universe—must be something which, while as I have just said holding nearest kinship with our highest conception of disposing power, must yet be immeasurably superior to the psychism of man."

In the orderly progress of the universe, organised by illimitable power and intelligence, there must have been purpose, and that purpose a high one. Looking over the whole realm of nature, we concededly find nothing so high as living form, and of these nothing so high as the human, and of mankind we have a vast range of relative capacities and qualities, the upper members of which are nearly Godlike, or, as a sacred writer has expressed it, "only a little lower than the angels."

These are the men and women who lead the way and point to still further triumphs beyond. They find their kindred in that divine galaxy of the great and good who have gone on before, enriched

with the priceless lessons of education, self-control, and experience, and filled with that inscrutable psychism which could only have come from the eternal and omnipresent psychism of such a creative agency, whether it be pictured as an individuality, a pervasion, an influx, an atmosphere, a surrounding nimbus, or as you may, but always as that "in whom we live, and move, and have our being."

In the lines of Wordsworth:

"Our birth is but a sleep and a forgetting:
The soul that rises with us, our life's star,
Hath had elsewhere its setting,
And cometh from afar:
Not in entire forgetfulness,
And not in utter nakedness,
But trailing clouds of glory do we come
From God, who is our home."

PHILADELPHIA, PA.

I. W. HEYSINGER.